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Summary of Conclusions.

1. Great divergence of practice exists on practically all features of influenza control as represented by the regulations and other measures which are in force throughout the country.

2. It is noticeable that 97.5 per cent of the 40 States considered require some system of reporting. The reports are made to the local health officer in 74.4 per cent of these States; to the State health officer in 12.8 per cent; and to both in 12.8 per cent. The method is the same in 92.3 per cent, namely, by mail.

3. There is a great division in practice in quarantine methods; also in regard to placarding.

4. A noticeable fact with regard to the policy of closing public places in time of epidemic is a tendency to shift the responsibility to the local health authorities. A number of comments which were received in addition to the straight answers to the questions indicated a growing inclination to the view that closing is useless.[1]

5. On the matter of public funerals the practice is fairly equally divided.

6. Relative to the use of serum, it is very clear that public health authorities, almost without exception, are unwilling to take the responsibility of making any recommendations whatsoever.

ACID BURNS ON HANDS OF SOLDERERS.

EXPERIENCE AT THE CURTIS BAY GENERAL ORDNANCE DEPOT, SOUTH BALTIMORE, MD.

By Harry W. Keatley, Acting Assistant Surgeon, United States Public Health Service.

The Process.

During the early part of April, 1920, a soldering department was established at the Curtis Bay General Ordnance Depot, South Baltimore, Md., in connection with the handling of shells placed for permanent storage. To assure safe storage, each shell is taken from its original case of heavy pasteboard and placed in a tin container, the top of which it is necessary to solder on in order to make the container absolutely airproof and waterproof. The personnel of this department consists of a foreman and several experienced solderers and their helpers.

The shells are taken from their individual containers by one group of laborers and placed upon an automatic conveyor. They are received by another group of men. These latter workers place the the shells in the storage containers of tin and drive the tin cover down snugly over the end. The containers are then passed to the soldering table, where the covers are soldered fast. From there they are taken by the helper to a large dipping vat and immersed for the purpose of determining their airproof and waterproof qualities. They are then passed on for packing in wooden boxes.

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[1] An extensive discussion of influenza control measures, in which this method receives considerable attention, is contained in "Influenza: A Study of Measures Adopted for the Control of the Epidemic," by W. H. Kellogg, M. D., published by the California State Board of Health, 1919.

The Problem—Acid Burns.

Shortly after these soldering operations were commenced, solderers and their helpers began to filter into the plant dispensary with what formerly was known, before the advent of the modern soldering fluids, as "acid cores." These "acid cores" usually occur on either surface of one or both hands; however, some burns of the face, some across the thigh, from leaning against the soldering table, and some on other parts of the body were received for treatment. The "acid cores" were single and multiple and varied from the size of the head of a pin to that of a 10-cent piece, or even larger. The severity of the burns seemed to depend upon the susceptibility of the patient, for it was noted that although some workers suffered no injury, others were burned, even though they wore light leather gloves to protect their hands.

When first seen the lesion shows a carbonized appearance, with a slight reddened and inflamed area surrounding; that is, it has the appearance of a dark colored or black crust, with an underlying small abscess containing a small quantity of blood-streaked pus. The burn, as a rule, involves all layers of the skin proper. From within 24 to 36 hours after exposure and contact, sloughing begins. Though responding quite readily to treatment, the burns may be a source of much pain and inconvenience to the patient. In some cases they were so severe that the patients were absent from their work from one day to several weeks, drawing compensation under the terms of the compensation act.

The increase in the number of such burns within the period of a few days, together with the possibility of a decrease in production in this department and a prospective increase in compensation claims for the loss of time, prompted an investigation to ascertain the primary cause of the burns and the steps necessary to prevent them.

How the Burns Are Caused.

This investigation showed that during the process of soldering it is necessary to use a liquid which will cause a slight erosion on the object to be soldered, in order that the lead solder will take hold. In this instance the liquid used was one of the several varieties of "Soldering Flux" or compounds which are sold on the market, consisting primarily of muriatic acid and zinc. In applying this flux to the shell containers and tin tops a swab consisting of a short stick was used. This stick was dipped into a can of soldering fluid and applied to the object to be soldered. The worker himself makes the application just before applying the heated solder. It was noticed

Public Health Reports, Vol. 35, No. 37, September 10, 1920.

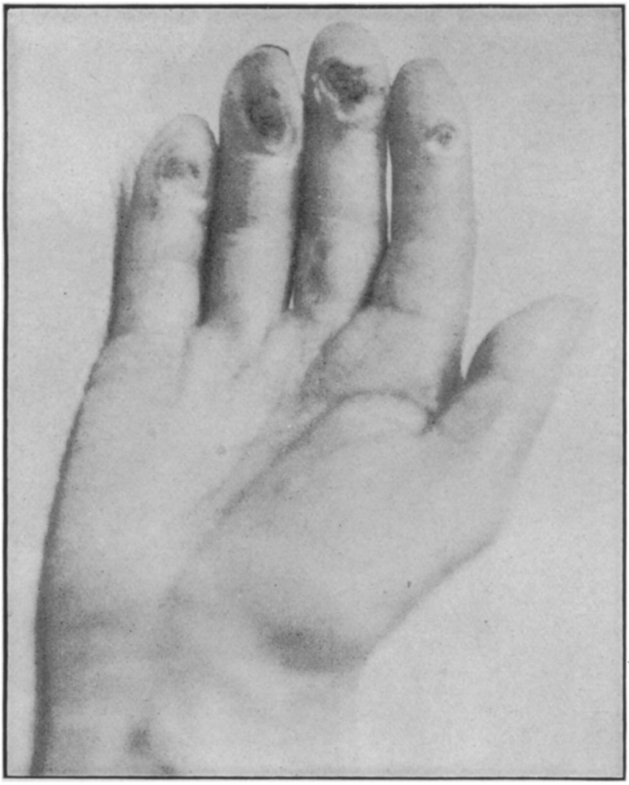

Fig. 1.—Acid burns ("acid cores").

that a drop or two of the fluid would almost invariably run toward the solderer's hand as he manipulated the swab, especially if care was not used, thus furnishing the contact which caused the burn. It was also noted that the flux when applied to the tin container would run down its side, even though only a small quantity was being used. When the solderer finished his work on a container the helper grasped it at both ends and transferred it to the testing tank. At times, in so doing, his hands would also come in contact with the soldering solution. Now, the particular brand of soldering fluid used at this depot was advertised as noncaustic. It was received in barrel lots; no directions accompanied the barrels, either as labels or circulars, and it was supposed by those in charge that it was to be used as received. Experience, however, proved otherwise.

Preventive Measures.

It was suggested that the use of the soldering fluid should be discontinued and that rosin or some other substitute be temporily employed pending a further investigation. This was not deemed feasible in view of the fact that these materials were not on hand, and the time consumed in procuring them would cause serious delay in production. The use of soldering flux was continued, but the men were directed to wash their hands at short intervals in a strong solution of bicarbonate of soda, which was furnished for the purpose. The manufacturer of the fluid, located in a near-by city, was communicated with. He disclaimed responsibility and stated he was at a loss to account for such burns, as the same flux was being used by several plants throughout the country without ill results. Another user of the same product was found who stated that at the beginning of the use of this fluid he had had one or two minor burns, but had eliminated further injuries by using as a washing solution a neutralizing solution of soda bicarbonate, in which the men had been directed to wash their hands whenever coming in contact with the fluid. As previously stated, this plan had been adopted at the Curtis Bay General Ordnance Depot as a temporary expedient, but it consumed a considerable amount of time in a days' work, and it was inconvenient to follow it. Furthermore, the fluid had been purchased by this depot in large quantities and a large supply was still on hand. It was then decided to try the effect of cutting down the strength of the solution—the manufacturer admitted that the fluid could be diluted to some extent in the soldering of tin. By experimentation the strength of the solution was finally reduced nearly 50 per cent, resulting in the entire elimination of the "acid cores," with no reduction in production.

By diluting the solution, not only is the normal output of work maintained, but there is a saving of practically one-half of the cost of the flux, as well as the elimination of an injury hazard carrying with it, in some cases, compensation costs for loss of time.